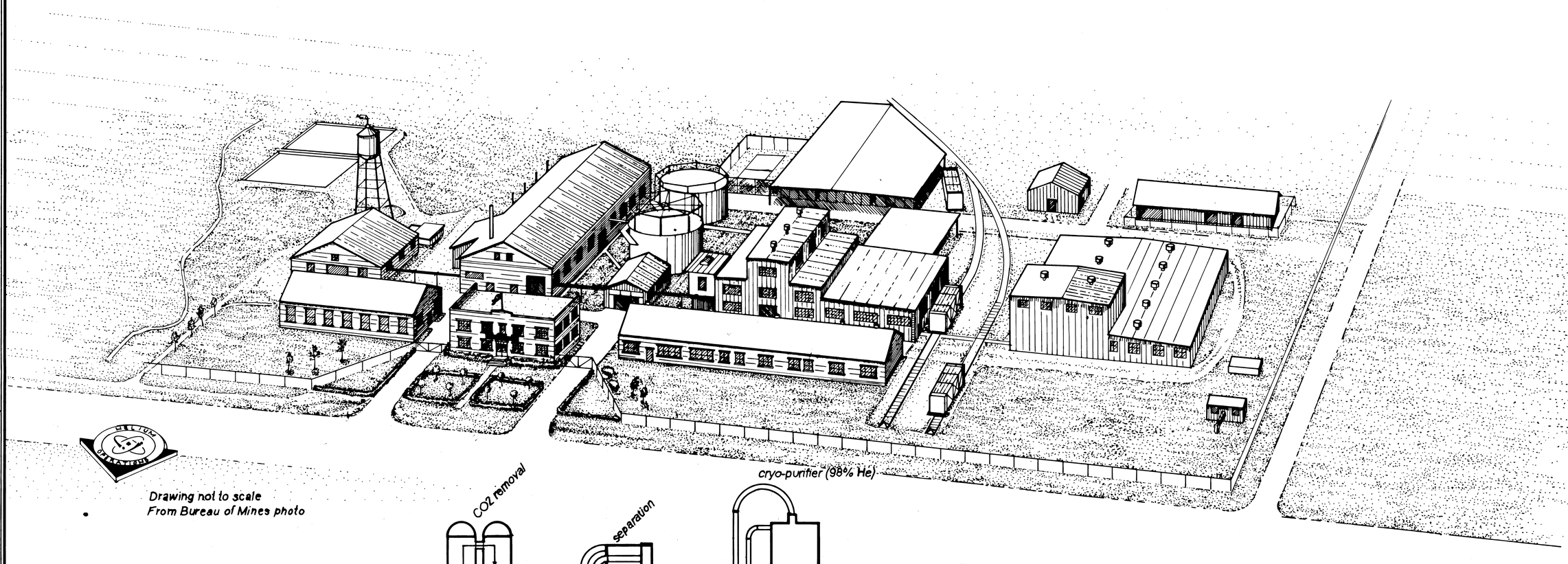
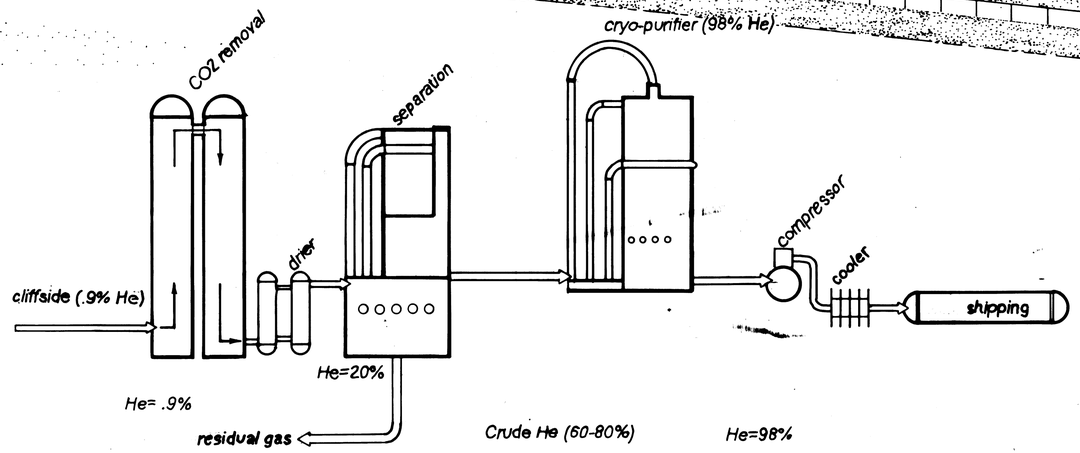
TRIM LINE

HELIUM PRODUCTION PROCESS

Amarillo Helium Plant



Drawing not to scale
From Bureau of Mines photo



By the time the Amarillo plant produced its first volume of helium in 1929 the U.S. Navy and U.S. Bureau of Mines had devised the technology to separate helium from natural gas. After receiving natural gas from the Cliffside field, the Amarillo plant removed the contaminant carbon dioxide (CO_2), then cryogenically separated the helium from nitrogen, hydrogen, oxygen and other gases. Once processed to 98 percent purity, the helium was stored in high pressure small cylinders or rail tank cars for shipment to naval air stations across the eastern U.S..

Initially, the gas flowed into the CO_2 Removal Units to begin separation of helium from natural gas. To satisfy increased national defense needs for helium in 1942-43, the Amarillo plant added a new CO_2 Removal Unit just south of the Power House building. After the CO_2 removal, the gas, still containing contaminants, flowed to the Separation Building. The gas was super cooled through a series of pressure regulation units & heat exchangers that increased and decreased gas pressure. Most of the contaminants liquified at -312° F and were drained away from the vaporized helium. The resulting 98% pure helium, which still contained traces of nitrogen and neon, supplied the Navy's dirigibles. During the 1920s and 1930s, the Amarillo plant shipped the final product to its customers in high pressure small cylinders and rail tank cars.

World War II and postwar applications such as heliarc welding of aluminum and titanium required a higher grade of helium. In 1945-46, Dr. Seibel's engineers added refrigerated charcoal during the cryogenics process. This modification removed nitrogen contaminants to produce a purer grade of 99.995 percent helium. Although first experimented with at the Amarillo plant, charcoal filtering was later utilized at Exell (1946) and the bureau's Midwestern plants.

Amarillo engineers began conservation measures as early as 1945. They pumped surplus crude helium (70-80% purity) back into the exhausted areas of the Cliffside reservoir. Eventually, this practice was the prototype for the helium conservation program that the Helium Conservation Act of 1960 mandated. No longer the principal helium production facility after 1943, the Amarillo Helium Plant served as the headquarters and the research and development center for the entire federal program until the 1990s.

DELINEATED BY: Lucas Dupuis 2001

HELIUM ACTIVITIES RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

U.S. BUREAU OF MINES, HELIUM PLANTS, AMARILLO HELIUM PLANT 1929
10,000 INTERCHANGE 552
POTTER COUNTY,
AMARILLO
TEXAS

SHEET 3 OF 4

HISTORIC AMERICAN ENGINEERING RECORD
TX-105 A

TRIM LINE